

NCP-1A-7585



Dart Aerospace Ltd.  
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**D5610-1TRN**  
**Job Sheet 197718**

**Part No:** D5610-1TRN**Job Qty:** 1 pcs**Part Name:** EC130 Aft Crosstube Turning Detail**Part Weight:** 0 lbs**Status:** New**Priority:** Medium**Job Created:** 7/15/19**Job Tracking No:****Due Date:** 7/26/19**Created By:** Marie Lajeunesse**Type:** SOLD**Description:****Note:** D5610 REV.B IPP REV:A 18.07.04 NEW ISSUE DD VERF:JFS**Ship Via:****Bill of Materials****Job Routing**

| Op No | Operation            | Qty   | Start Date | Due Date | Standard  |         | Workcenter/Supplier   |           | Lead Time | DAS Sign-off         |
|-------|----------------------|-------|------------|----------|-----------|---------|-----------------------|-----------|-----------|----------------------|
|       |                      |       |            |          | Setup Hrs | Run Hrs | Workcenter / Supplier | Lead Time |           |                      |
| 100   | Mori Seiki TL-40 - 1 | 1 pcs | 7/26/19    | 7/26/19  | 1.00      | 2.00    | Mori Seiki TL-40 - 1  |           |           | 662019-07-22<br>9-89 |
| 110   | QC 2                 | 1 pcs | 7/26/19    | 7/26/19  | 0.00      | 0.00    | QC 2 - 1              |           |           |                      |
|       |                      |       |            |          |           |         | QC 2 - 12             |           |           |                      |
|       |                      |       |            |          |           |         | QC 2 - 14             |           |           |                      |
|       |                      |       |            |          |           |         | QC 2 - 17             |           |           |                      |
|       |                      |       |            |          |           |         | QC 2 - 19             |           |           |                      |
|       |                      |       |            |          |           |         | QC 2 - 2              |           |           |                      |
|       |                      |       |            |          |           |         | QC 2 - 20             |           |           |                      |
|       |                      |       |            |          |           |         | QC 2 - 22             |           |           |                      |
|       |                      |       |            |          |           |         | QC 2 - 23             |           |           |                      |
|       |                      |       |            |          |           |         | QC 2 - 25             |           |           |                      |
|       |                      |       |            |          |           |         | QC 2 - 32             |           |           |                      |
|       |                      |       |            |          |           |         | QC 2 - 33             |           |           |                      |
|       |                      |       |            |          |           |         | QC 2 - 35             |           |           |                      |
|       |                      |       |            |          |           |         | QC 2 - 39             |           |           |                      |
|       |                      |       |            |          |           |         | QC 2 - 4              |           |           |                      |
|       |                      |       |            |          |           |         | QC 2 - 40             |           |           |                      |
|       |                      |       |            |          |           |         | QC 2 - 44             |           |           |                      |
|       |                      |       |            |          |           |         | QC 2 - 45             |           |           |                      |
|       |                      |       |            |          |           |         | QC 2 - 48             |           |           |                      |
|       |                      |       |            |          |           |         | QC 2 - 49             |           |           |                      |
|       |                      |       |            |          |           |         | QC 2 - 50             |           |           |                      |
|       |                      |       |            |          |           |         | QC 2 - 51             |           |           |                      |
|       |                      |       |            |          |           |         | QC 2 - 52             |           |           |                      |
|       |                      |       |            |          |           |         | QC 2 - 57             |           |           |                      |
|       |                      |       |            |          |           |         | QC 2 - 62             |           |           |                      |
|       |                      |       |            |          |           |         | QC 2 - 63             |           |           |                      |
|       |                      |       |            |          |           |         | QC 2 - 8              |           |           |                      |
|       |                      |       |            |          |           |         | QC 2 - 66             |           |           | 662019-07-22<br>9-89 |
|       |                      |       |            |          |           |         | QC 2 - 64             |           |           |                      |
|       |                      |       |            |          |           |         | QC 2 - 65             |           |           |                      |

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P.T.O.

7/15/2019

## [Dart Hawkesbury] Job Sheet - Lajeunesse, Marie

|     |                            |       |         |           |                            |                             |
|-----|----------------------------|-------|---------|-----------|----------------------------|-----------------------------|
|     |                            |       |         |           | QC 2 - 5                   |                             |
|     |                            |       |         |           | QC 2 - 71                  |                             |
|     |                            |       |         |           | QC 2 - 73                  |                             |
|     |                            |       |         |           | QC 2 - 69                  |                             |
| 120 | Mori Seiki TL-40 - 1 - B4B | 1 pcs | 7/26/19 | 1.00 2.00 | Mori Seiki TL-40 - 1 - B4B | DAS<br>662019-07-23<br>9-89 |
| 130 | QC 2                       | 1 pcs | 7/26/19 | 0.00 0.00 | QC 2 - 1                   |                             |
|     |                            |       |         |           | QC 2 - 12                  |                             |
|     |                            |       |         |           | QC 2 - 14                  |                             |
|     |                            |       |         |           | QC 2 - 17                  |                             |
|     |                            |       |         |           | QC 2 - 19                  |                             |
|     |                            |       |         |           | QC 2 - 2                   |                             |
|     |                            |       |         |           | QC 2 - 20                  |                             |
|     |                            |       |         |           | QC 2 - 22                  |                             |
|     |                            |       |         |           | QC 2 - 23                  |                             |
|     |                            |       |         |           | QC 2 - 25                  |                             |
|     |                            |       |         |           | QC 2 - 32                  |                             |
|     |                            |       |         |           | QC 2 - 33                  |                             |
|     |                            |       |         |           | QC 2 - 35                  |                             |
|     |                            |       |         |           | QC 2 - 39                  |                             |
|     |                            |       |         |           | QC 2 - 4                   |                             |
|     |                            |       |         |           | QC 2 - 40                  |                             |
|     |                            |       |         |           | QC 2 - 44                  |                             |
|     |                            |       |         |           | QC 2 - 45                  |                             |
|     |                            |       |         |           | QC 2 - 48                  |                             |
|     |                            |       |         |           | QC 2 - 49                  |                             |
|     |                            |       |         |           | QC 2 - 50                  |                             |
|     |                            |       |         |           | QC 2 - 51                  |                             |
|     |                            |       |         |           | QC 2 - 52                  |                             |
|     |                            |       |         |           | QC 2 - 57                  |                             |
|     |                            |       |         |           | QC 2 - 62                  |                             |
|     |                            |       |         |           | QC 2 - 63                  |                             |
|     |                            |       |         |           | QC 2 - 8                   | DAS                         |
|     |                            |       |         |           | QC 2 - 66                  | 662019-07-23                |
|     |                            |       |         |           | QC 2 - 64                  | 9-89                        |
|     |                            |       |         |           | QC 2 - 65                  |                             |
|     |                            |       |         |           | QC 2 - 5                   |                             |
|     |                            |       |         |           | QC 2 - 71                  |                             |
|     |                            |       |         |           | QC 2 - 73                  |                             |
|     |                            |       |         |           | QC 2 - 69                  |                             |
| 140 | QC 8                       | 1 pcs | 7/26/19 | 0.00 0.00 | QC 8 - 12                  |                             |
|     |                            |       |         |           | QC 8 - 14                  |                             |
|     |                            |       |         |           | QC 8 - 17                  |                             |
|     |                            |       |         |           | QC 8 - 20                  |                             |
|     |                            |       |         |           | QC 8 - 25                  |                             |
|     |                            |       |         |           | QC 8 - 3                   |                             |
|     |                            |       |         |           | QC 8 - 32                  |                             |
|     |                            |       |         |           | QC 8 - 33                  |                             |
|     |                            |       |         |           | QC 8 - 35                  |                             |
|     |                            |       |         |           | QC 8 - 39                  |                             |
|     |                            |       |         |           | QC 8 - 4                   |                             |
|     |                            |       |         |           | QC 8 - 44                  |                             |
|     |                            |       |         |           | QC 8 - 45                  |                             |
|     |                            |       |         |           | QC 8 - 49                  |                             |
|     |                            |       |         |           | QC 8 - 58                  |                             |
|     |                            |       |         |           | QC 8 - 8                   |                             |
|     |                            |       |         |           | QC 8 - 9                   |                             |
|     |                            |       |         |           | QC 8 - 68                  |                             |
|     |                            |       |         |           | QC 8 - 67                  |                             |
|     |                            |       |         |           | QC 8 - 1 (A)               |                             |

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|                                       |       |         |           |                        |           |              |
|---------------------------------------|-------|---------|-----------|------------------------|-----------|--------------|
|                                       |       |         |           |                        | QC 8 - 47 |              |
|                                       |       |         |           |                        | QC 8 - 40 |              |
|                                       |       |         |           |                        | QC 8 - 52 |              |
|                                       |       |         |           |                        | QC 8 - 23 |              |
|                                       |       |         |           |                        | QC 8 - 57 |              |
| 145 Crosstubes - 4 - B4B              | 1 pcs | 7/26/19 | 0.00 0.67 | Crosstubes - 1 - B4B   |           | BB 7/30/2019 |
|                                       |       |         |           | Crosstubes - 2 - B4B   |           |              |
|                                       |       |         |           | Crosstubes - 3 - B4B   |           |              |
|                                       |       |         |           | Crosstubes - 4 - B4B   |           |              |
| 150 Crosstubes - 5 - B4B              | 1 pcs | 7/26/19 | 0.00 1.00 | Crosstubes - 1 - B4B   |           |              |
|                                       |       |         |           | Crosstubes - 2 - B4B   |           |              |
|                                       |       |         |           | Crosstubes - 3 - B4B   |           |              |
|                                       |       |         |           | Crosstubes - 4 - B4B   |           | JUL 31 2019  |
| 160 QC 7                              | 1 pcs | 7/26/19 | 0.00 0.00 | QC 7 - 10              |           |              |
|                                       |       |         |           | QC 7 - 13              |           |              |
|                                       |       |         |           | QC 7 - 14              |           |              |
|                                       |       |         |           | QC 7 - 15              |           |              |
|                                       |       |         |           | QC 7 - 17              |           |              |
|                                       |       |         |           | QC 7 - 18              |           | BE           |
|                                       |       |         |           | QC 7 - 19              |           |              |
|                                       |       |         |           | QC 7 - 2               |           |              |
|                                       |       |         |           | QC 7 - 28              |           |              |
|                                       |       |         |           | QC 7 - 3               |           |              |
|                                       |       |         |           | QC 7 - 30              |           |              |
|                                       |       |         |           | QC 7 - 34              |           |              |
|                                       |       |         |           | QC 7 - 36              |           |              |
|                                       |       |         |           | QC 7 - 37              |           |              |
|                                       |       |         |           | QC 7 - 41              |           |              |
|                                       |       |         |           | QC 7 - 47              |           |              |
|                                       |       |         |           | QC 7 - 48              |           |              |
|                                       |       |         |           | QC 7 - 51              |           |              |
|                                       |       |         |           | QC 7 - 58              |           |              |
|                                       |       |         |           | QC 7 - 59              |           |              |
|                                       |       |         |           | QC 7 - 60              |           |              |
|                                       |       |         |           | QC 7 - 9               |           |              |
|                                       |       |         |           | QC 7 - 68              |           |              |
|                                       |       |         |           | QC 7 - 50              |           |              |
|                                       |       |         |           | QC 7 - 67              |           |              |
|                                       |       |         |           | QC 7 - 40              |           |              |
|                                       |       |         |           | QC 7 - 24              |           |              |
|                                       |       |         |           | QC 7 - 43              |           |              |
|                                       |       |         |           | QC 7 - 61              |           |              |
|                                       |       |         |           | QC 7 - 81              |           |              |
| 170 Packaging 3-1 - Stock - B4B 1 pcs |       | 7/26/19 | 0.00 0.00 | Packaging 3 - 1 - B4B  |           |              |
|                                       |       |         |           | Packaging 3 - 2 - B4B  |           |              |
|                                       |       |         |           | Packaging 3 - 3 - B4B  |           |              |
|                                       |       |         |           | Packaging 3 - 4 - B4B  |           |              |
|                                       |       |         |           | Packaging 3 - 5 - B4B  |           |              |
|                                       |       |         |           | Packaging 3 - 6 - B4B  |           |              |
|                                       |       |         |           | Packaging 3 - 7 - B4B  |           |              |
|                                       |       |         |           | Packaging 3 - 8 - B4B  |           |              |
|                                       |       |         |           | Packaging 3 - 9 - B4B  |           |              |
|                                       |       |         |           | Packaging 3 - 10 - B4B |           |              |
|                                       |       |         |           | Packaging 3 - 11 - B4B |           |              |
|                                       |       |         |           | Packaging 3 - 12 - B4B |           |              |
|                                       |       |         |           | Packaging 3 - 13 - B4B |           |              |
|                                       |       |         |           | Packaging 3 - 14 - B4B |           |              |
|                                       |       |         |           | Packaging 3 - 15 - B4B |           |              |
|                                       |       |         |           | Packaging 3 - 16 - B4B |           |              |

7/15/2019

## [Dart Hawkesbury] Job Sheet - Lajeunesse, Marie

|                |       |         |           |                 |                        |  |
|----------------|-------|---------|-----------|-----------------|------------------------|--|
|                |       |         |           |                 | Packaging 3 - 17 - B4B |  |
|                |       |         |           |                 | Packaging 3 - 18 - B4B |  |
|                |       |         |           |                 | Packaging 3 - 19 - B4B |  |
|                |       |         |           |                 | Packaging 3 - 20 - B4B |  |
|                |       |         |           |                 | Packaging 3 - 21 - B4B |  |
|                |       |         |           |                 | Packaging 3 - 22 - B4B |  |
|                |       |         |           |                 | Packaging 3 - 23 - B4B |  |
|                |       |         |           |                 | Packaging 3 - 24 - B4B |  |
|                |       |         |           |                 | Packaging 3 - 25 - B4B |  |
|                |       |         |           |                 | Packaging 3 - 26 - B4B |  |
|                |       |         |           |                 | Packaging 3 - 27 - B4B |  |
|                |       |         |           |                 | Packaging 3 - 28 - B4B |  |
|                |       |         |           |                 | Packaging 3 - 29 - B4B |  |
|                |       |         |           |                 | Packaging 3 - 30 - B4B |  |
|                |       |         |           |                 | Packaging 3 - 31 - B4B |  |
|                |       |         |           |                 | Packaging 3 - 32 - B4B |  |
|                |       |         |           |                 | Packaging 3 - 33 - B4B |  |
|                |       |         |           |                 | Packaging 3 - 34 - B4B |  |
|                |       |         |           |                 | Packaging 3 - 35 - B4B |  |
|                |       |         |           |                 | Packaging 3 - 36 - B4B |  |
| 180 QC 21 - SA | 1 pcs | 7/26/19 | 0.00 0.00 | QC 21 - SA - 21 |                        |  |
|                |       |         |           | QC 21 - SA - 70 |                        |  |
|                |       |         |           | QC 21 - SA - 53 |                        |  |

AUG 01 2019

Part Op 100 - 1- Fill tube with sand & install plugs 2- Face and chamfer both ends as per Folio FC197 3- Turn first taper section on  
 Descriptions: both side

110 - QC2- Inspect parts off machine FAI/FAIB

120 - 1- Turn second taper on both side 2- Scribe part # and batch # using vibrating stylus on INSIDE the cuff as per Dwg D5610-TRN

130 - QC2- Inspect parts off machine FAI/FAIB

140 - QC8- Inspect parts - second check

145 - GRIND ONLY TRANSITION LINES SMOOTH LONGITUDE WAY.

150 - 1- handfinish X-TUBE INSIDE AND OUT

160 - \*\*\*IDENTIFY SERIAL/ P/N # BY USING A MARKER IN THE MIDDLE OF TUBE AT CONTAINER CREATION\*\*\*

\*\*\*INSPECT ALODINE AND MAKE SURE TUBE IS IDENTIFY WITH MARKER IN THE MIDDLE OF THE TUBE\*\*\*

170 - \*\*\*IDENTIFY SERIAL # BY USING A MARKER IN THE MIDDLE OF TUBE AT CONTAINER CREATION\*\*\*

\*\*\*INSPECT ALODINE AND MAKE SURE TUBE IS IDENTIFY WITH MARKER IN THE MIDDLE OF THE TUBE\*\*\*

180 - QC21- Final Inspection - Work Order Release

## Job BOM

| Part / Item | Component Name | Quantity     | Operation                | Container |
|-------------|----------------|--------------|--------------------------|-----------|
| D6030-140   | Tube, Seamless | 1 pcs (1 ea) | 100-Mori Seiki TL-40 - 1 | S198460   |

## Job Allocations

| Operation                | Component Part | Required | Inventory | Allocated |
|--------------------------|----------------|----------|-----------|-----------|
| 100-Mori Seiki TL-40 - 1 | D6030-140      | 1        | 17        | 0         |

## Part Specifications

Specifications could not be found.



Container No: S199643



Part: D5610-1TRN

Job No: 197718

Serial No/Batch: S199643

Revision: B

Inspector:

Exp Date:

Instructions: Various STC's

Dart Aerospace Ltd.  
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Date: 07/22/19

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|                                 |        |                         |
|---------------------------------|--------|-------------------------|
| DART AEROSPACE LTD              |        | Work Order: 197718      |
| Description: Crosstube Assembly |        | Part Number: 05610-ITRN |
| Inspection Dwg: B               | Rev: B | Page 1 of 2             |

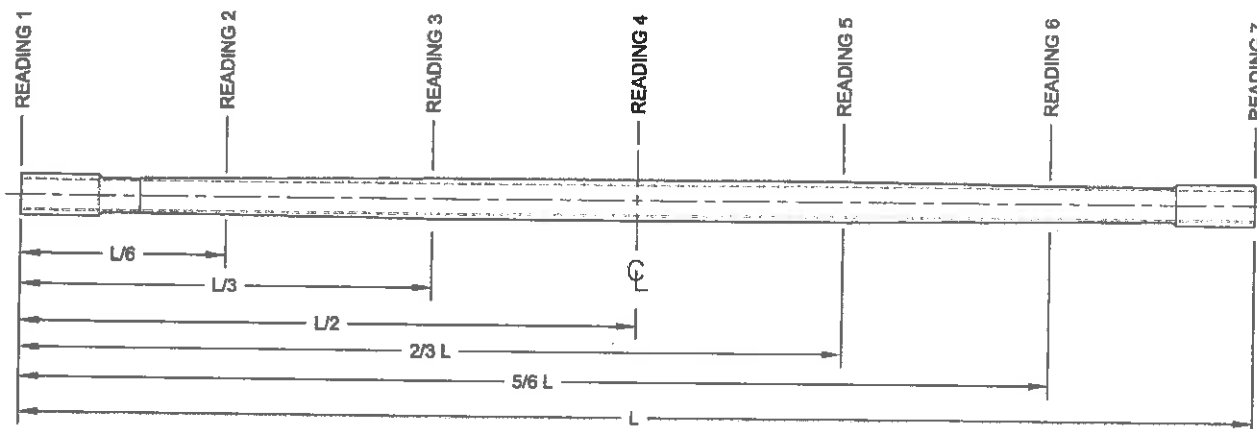
## FIRST ARTICLE INSPECTION CHECKLIST

|        | Inspection Sheet<br>Drawing Dimension | Tolerance     | Actual<br>Dimension | Accept | Reject | Method of<br>Inspection | Comments  |
|--------|---------------------------------------|---------------|---------------------|--------|--------|-------------------------|-----------|
| SIDE A | 3.300                                 | +0.005/-0.000 | 3.305               | ✓      |        | CNC-05                  |           |
|        | 3.344                                 | +0.005/-0.000 | 3.349               | ✓      |        | "                       |           |
|        | 3.398                                 | +0.005/-0.000 | 3.403               | ✓      |        | "                       |           |
|        | 3.457                                 | +0.005/-0.000 | 3.462               | ✓      |        | "                       |           |
|        | 3.518                                 | +0.005/-0.000 | 3.523               | ✓      |        | "                       |           |
|        | 3.543                                 | +0.005/-0.000 | 3.542               | ✓      |        | "                       | Stock Mat |
| SIDE B | 3.300                                 | +0.005/-0.000 | 3.305               | ✓      |        | CNC-05                  |           |
|        | 3.344                                 | +0.005/-0.000 | 3.349               | ✓      |        | "                       |           |
|        | 3.398                                 | +0.005/-0.000 | 3.403               | ✓      |        | "                       |           |
|        | 3.457                                 | +0.005/-0.000 | 3.462               | ✓      |        | "                       |           |
|        | 3.518                                 | +0.005/-0.000 | 3.521               | ✓      |        | "                       |           |
|        | 3.543                                 | +0.005/-0.000 | 3.542               | ✓      |        | "                       | Stock Mat |
|        | 116.26                                | +/- 0.30      | 116.24              | ✓      |        | Tape                    |           |

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|                                 |        |                         |
|---------------------------------|--------|-------------------------|
| DART AEROSPACE LTD              |        | Work Order: 197718      |
| Description: Crosstube Assembly |        | Part Number: D5610-1TRN |
| Inspection Dwg: B               | Rev: B | Page 2 of 2             |

### WALL THICKNESS MEASUREMENT



| Location               | WALL THICKNESS MEASUREMENT (IN) |      |      |      | Deviation<br>$\Delta w$<br>(max-min) | TOLERANCE |
|------------------------|---------------------------------|------|------|------|--------------------------------------|-----------|
|                        | w1                              | w2   | w3   | w4   |                                      |           |
| READING 1<br>L= 0"     | .179                            | .197 | .204 | .191 | .025                                 | x/.030    |
| READING 2<br>L= 19.38  | .263                            | .248 | .234 | .248 | .029                                 |           |
| READING 3<br>L= 38.75  | .318                            | .313 | .288 | .305 | .030                                 |           |
| READING 4<br>L= 58.13  | .324                            | .320 | .316 | .318 | .008                                 |           |
| READING 5<br>L= 77.51  | .310                            | .303 | .318 | .320 | .017                                 |           |
| READING 6<br>L= 96.88  | .259                            | .241 | .239 | .246 | .020                                 |           |
| READING 7<br>L= 116.26 | .202                            | .187 | .183 | .187 | .019                                 |           |

#### Calibration Result

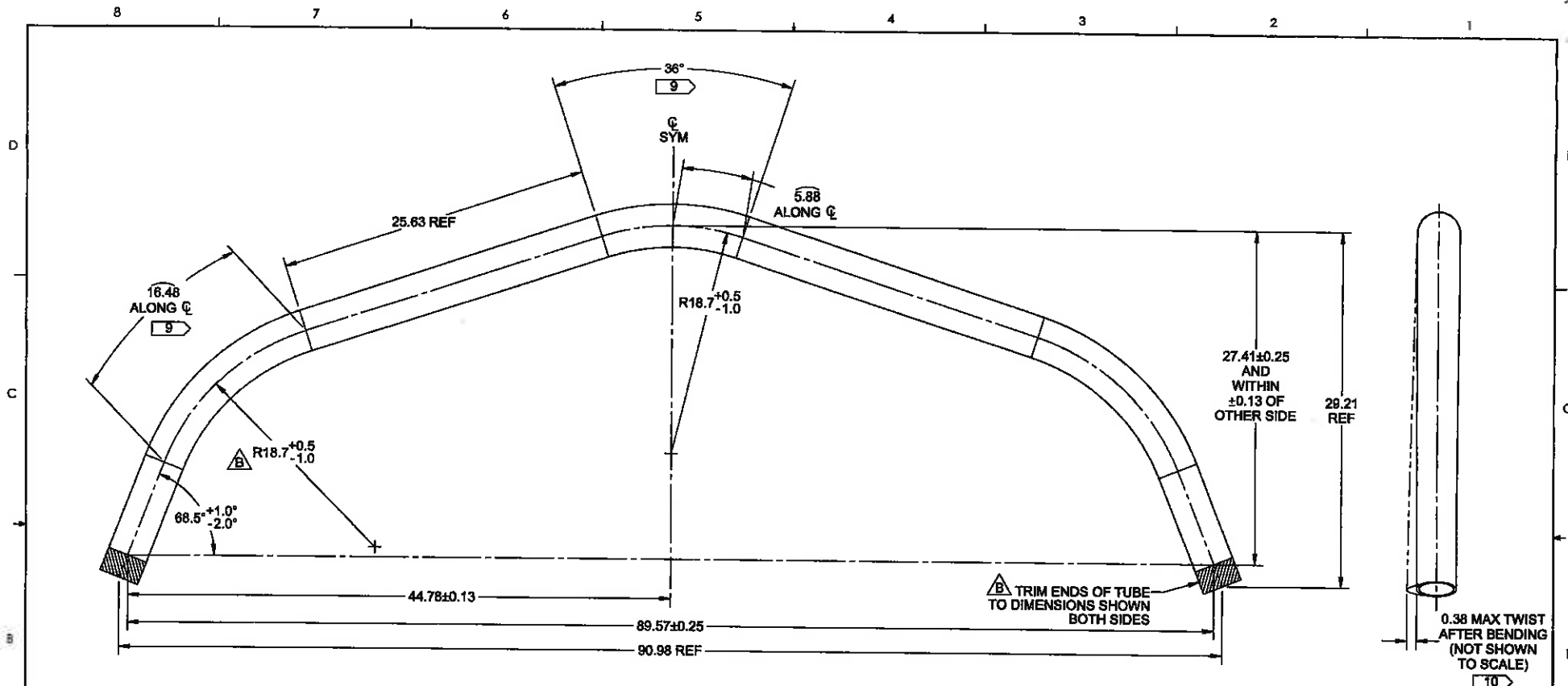
Actual Block Thickness: 100-400

SITESCAN 250 Measured Thickness: 100-400

|                            |                           |                       |
|----------------------------|---------------------------|-----------------------|
| Measured by: <b>DAS 66</b> | Audited by: <b>DAS 47</b> | Preliminary Approval: |
| Date: 2019-07-23           | Date: 19-07-29            | Date:                 |

| Rev | Date     | Change                     | Revised by | Approved |
|-----|----------|----------------------------|------------|----------|
| B   | 10.04.14 | Added preliminary approval | KJ         |          |
| C   | 12.06.01 | Wall thickness form added  | KJ         |          |



**D5610-1 AFT X-TUBE (EC130)**

**NOTES:**

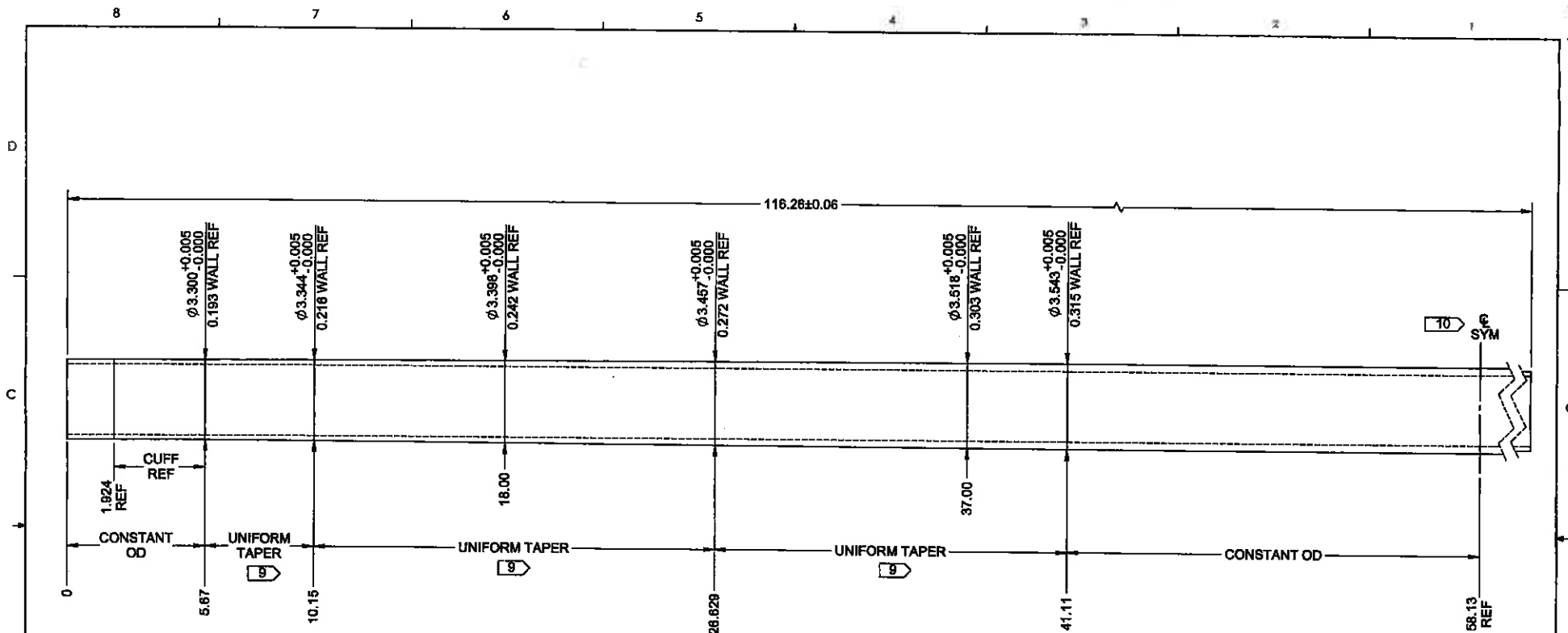
- 1) MATERIAL: MAKE FROM D5610-1TRN
- 2) FINISH: NONE
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: N/A
- 6) IDENTIFICATION: NONE
- 7) WEIGHT: 30.9 lbs
- 8) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, WRINKLES, OR DENTS. DEFECTS UP TO 0.005 MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE
- 9) MAX AMPLITUDE OF RIBBLING ALONG BENT PORTION OF THE TUBE IS 0.030. MAX CRUSHING 2% OVER ALL BEND LOCATIONS.
- 10) MAX TWIST: WITH TUBE LAYED FLAT ON SURFACE, THE DIFFERENCE BETWEEN THE CUFF HEIGHTS FROM THE SURFACE MAY BE NO LARGER THAN 0.38

**RELEASED**

2019 FEB 25  
2019-19-567

|            |                                                                                                                                                                                                |                                                                                                                                                                                                                                                      |              |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| REV.       | DESCRIPTION                                                                                                                                                                                    | BY                                                                                                                                                                                                                                                   | DATE         |
|            |                                                                                                                                                                                                |                                                                                                                                                                                                                                                      |              |
| B          | D5610-1: ADDED OUTER BENDS AND TRIM ENDS, REMOVED SECTION A-A<br>D5610-3: DELETED Ø0.385 HOLES FOR SADDLES<br>SECTION C-C CSINK HOLES QTY 4 WAS QTY 6, DIM 0.835<br>WAS 0.875, 2.806 WAS 2.932 | ZF                                                                                                                                                                                                                                                   | 19.01.04     |
| A          | NEW ISSUE                                                                                                                                                                                      | ZF                                                                                                                                                                                                                                                   | 18.05.07     |
| DESIGN     | NO                                                                                                                                                                                             | <b>DART AEROSPACE LTD</b><br>HAWKESBURY, ONTARIO, CANADA                                                                                                                                                                                             |              |
| DRAWN      | ZF                                                                                                                                                                                             |                                                                                                                                                                                                                                                      |              |
| CHECKED    | MW                                                                                                                                                                                             | DRAWING NO.                                                                                                                                                                                                                                          | REV. B       |
| MFG. APPR. | JFS                                                                                                                                                                                            | <b>D5610</b>                                                                                                                                                                                                                                         | SHEET 1 OF 3 |
| APPROVED   | NO                                                                                                                                                                                             | TITLE:                                                                                                                                                                                                                                               | SCALE        |
| DE APPR.   | CP 47                                                                                                                                                                                          | <b>AFT X-TUBE (EC130)</b>                                                                                                                                                                                                                            | NTS          |
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APPROVED



# **D5610-1TRN TURNED TUBE**

## **NOTES:**

- 1) MATERIAL: MAKE FROM D6030-140
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: NONE
- 7) WEIGHT: 31.7 lbs
- 8) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005 MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE
- 9) WHEN MACHINING TAPER, RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALLY.
- 10) PART SYMMETRICAL ABOUT CENTER LINE

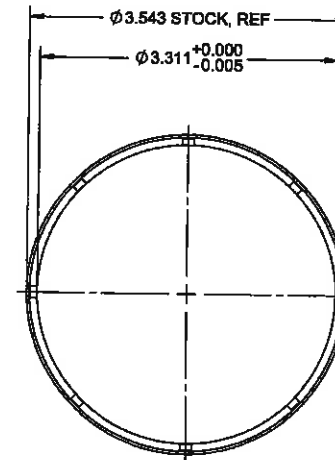
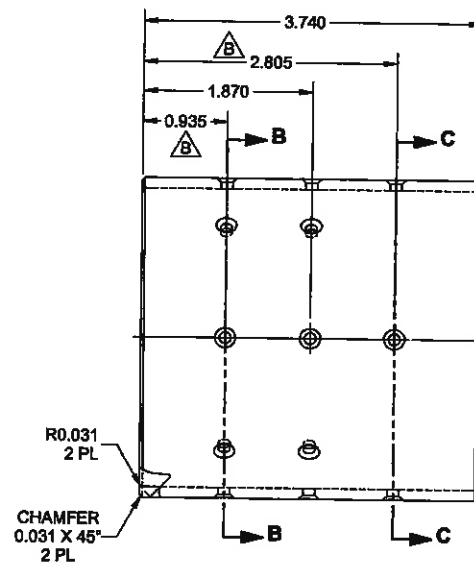
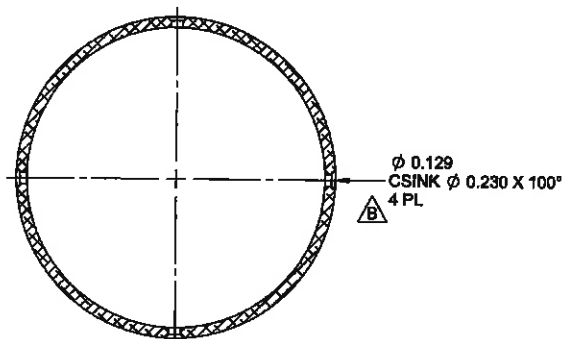
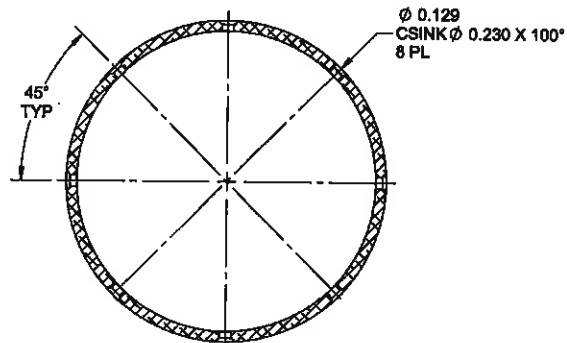
RELEASED

2010 FEB 25

APPROVED

|            |          |                                                                                                                                                                                                                     |              |
|------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| DESIGN     | NO       | <b>DART AEROSPACE LTD</b><br>HAWKESBURY, ONTARIO, CANADA                                                                                                                                                            |              |
| DRAWN      | ZF       |                                                                                                                                                                                                                     |              |
| CHECKED    | MW       | DRAWING NO.                                                                                                                                                                                                         | REV. B       |
| MFG. APPR. | JFS      | <b>D5610</b>                                                                                                                                                                                                        | SHEET 2 OF 3 |
| APPROVED   | NO       | TITLE                                                                                                                                                                                                               | SCALE        |
| DE APPR.   | CP       | <b>AFT X-TUBE (EC130)</b>                                                                                                                                                                                           | NTS          |
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D5610-3 CUFF

- NOTES:
- 1) MATERIAL: MAKE FROM D8030-140
  - 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
  - 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
  - 4) UNITS: INCHES UNLESS OTHERWISE NOTED
  - 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
  - 6) IDENTIFICATION: NONE
  - 7) WEIGHT: 0.47 lbs

RELEASED  
2019 FEB 25

APPROVED

|            |          |                                                                                                                                                                                                                                                              |              |
|------------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| DESIGN     | NO       | <b>DART AEROSPACE LTD</b>                                                                                                                                                                                                                                    |              |
| DRAWN      | ZF       | HAWKESBURY, ONTARIO, CANADA                                                                                                                                                                                                                                  |              |
| CHECKED    | MW       | DRAWING NO.                                                                                                                                                                                                                                                  | REV. B       |
| MFG. APPR. | JFS      | D5610                                                                                                                                                                                                                                                        | SHEET 3 OF 3 |
| APPROVED   | NO       | TITLE                                                                                                                                                                                                                                                        | SCALE        |
| DE APPR.   | CP       | AFT X-TUBE (EC130)                                                                                                                                                                                                                                           | NTS          |
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Entered:

2R

Date:

Oct 28/19



NCR No.

19-7585

## WORK ORDER NON-CONFORMANCE / ROUTE UPDATE

Route update only

|                                                                                                                                                                                                                                                                                                                                                                                                |                                                          |                                                                                                                                          |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |                                                        |  |                                          |                                        |                                           |                                           |                                  |                                                |                                        |                                            |                                   |                                    |                                          |                                  |                                 |                                               |                               |                                 |                                                       |                                                          |                                             |                                            |                                                   |                                      |                                          |                                  |                                                |                                       |                                         |  |
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| Job: <u>197728</u><br>Part No. <u>D5610-ITRN</u>                                                                                                                                                                                                                                                                                                                                               |                                                          | <b>DISPOSITION</b><br>Rework <input type="checkbox"/><br>Scrap <input type="checkbox"/><br>Use-as-is <input checked="" type="checkbox"/> |                                            | <b>DEPARTMENT/PROCESS</b><br>Skid-tube <input type="checkbox"/> Cross tube <input checked="" type="checkbox"/><br>Machining <input type="checkbox"/> Small Fab <input type="checkbox"/><br>Large Fab <input type="checkbox"/> Finishing <input type="checkbox"/><br>Eng. (Non-AW) <input type="checkbox"/> Engineering <input type="checkbox"/><br>Prod. Eng. Coord. <input type="checkbox"/> Water Jet <input type="checkbox"/><br>Rec/Store/Packaging <input type="checkbox"/> Supplier <input type="checkbox"/><br>Quality <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |                                                        |  |                                          |                                        |                                           |                                           |                                  |                                                |                                        |                                            |                                   |                                    |                                          |                                  |                                 |                                               |                               |                                 |                                                       |                                                          |                                             |                                            |                                                   |                                      |                                          |                                  |                                                |                                       |                                         |  |
| Date: <u>19/7/31</u>                                                                                                                                                                                                                                                                                                                                                                           |                                                          | Sequence #:                                                                                                                              |                                            | QTY Affected: <u>1</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  | MRB (QSI042)<br><u>INSP 12</u> <u>4</u> <u>19/7/31</u> |  |                                          |                                        |                                           |                                           |                                  |                                                |                                        |                                            |                                   |                                    |                                          |                                  |                                 |                                               |                               |                                 |                                                       |                                                          |                                             |                                            |                                                   |                                      |                                          |                                  |                                                |                                       |                                         |  |
| Description Work Order Deviation                                                                                                                                                                                                                                                                                                                                                               |                                                          |                                                                                                                                          |                                            | Disposition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                                                        |  |                                          |                                        |                                           |                                           |                                  |                                                |                                        |                                            |                                   |                                    |                                          |                                  |                                 |                                               |                               |                                 |                                                       |                                                          |                                             |                                            |                                                   |                                      |                                          |                                  |                                                |                                       |                                         |  |
| Tube had surface marks in central region of crasstube. $\pm 0.005$ material was removed in some regions to remove marks.                                                                                                                                                                                                                                                                       |                                                          |                                                                                                                                          |                                            | Acceptable.<br>Min O.D. = 3.538 ( $\pm 0.005$ ). Previous wall thickness was over tolerance. D6020 allows $\pm 0.015$ mean, $\pm 0.031$ eccentricity. Tube is within allowable section properties by inspection.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                                        |  |                                          |                                        |                                           |                                           |                                  |                                                |                                        |                                            |                                   |                                    |                                          |                                  |                                 |                                               |                               |                                 |                                                       |                                                          |                                             |                                            |                                                   |                                      |                                          |                                  |                                                |                                       |                                         |  |
| <b>Root Cause</b><br>Operator <input type="checkbox"/><br>Manufacturing Process <input checked="" type="checkbox"/><br>Equip/Tooling <input type="checkbox"/><br>Handling/Preservation <input type="checkbox"/><br>Material <input type="checkbox"/><br>Product Improvement <input type="checkbox"/><br>Process Improvement <input type="checkbox"/><br>Human Factors <input type="checkbox"/> |                                                          |                                                                                                                                          |                                            | <b>FAULT CATEGORY</b><br><table border="0"> <tr> <td><input type="checkbox"/> Pressure/Forced</td> <td><input type="checkbox"/> Contamination</td> <td><input type="checkbox"/> Power Loss/Surge</td> <td><input type="checkbox"/> Positioned Wrong</td> </tr> <tr> <td><input type="checkbox"/> Bending</td> <td><input type="checkbox"/> Misaligned/off center</td> <td><input type="checkbox"/> Folio/Program</td> <td><input type="checkbox"/> Outside Tolerance</td> </tr> <tr> <td><input type="checkbox"/> Crushing</td> <td><input type="checkbox"/> BOM/Route</td> <td><input type="checkbox"/> Grain Direction</td> <td><input type="checkbox"/> Drawing</td> </tr> <tr> <td><input type="checkbox"/> Cracks</td> <td><input type="checkbox"/> Broken/Damage/Defect</td> <td><input type="checkbox"/> Weld</td> <td><input type="checkbox"/> Finish</td> </tr> <tr> <td><input type="checkbox"/> Crimp/Kink/Ripple/Wave/Twist</td> <td><input type="checkbox"/> Incomplete/Unclear Instructions</td> <td><input type="checkbox"/> Wrong Stock Pulled</td> <td><input type="checkbox"/> Part Lost/Missing</td> </tr> <tr> <td><input checked="" type="checkbox"/> Marks/Chatter</td> <td><input type="checkbox"/> Drill Holes</td> <td><input type="checkbox"/> Out of Sequence</td> <td><input type="checkbox"/> Misread</td> </tr> <tr> <td><input checked="" type="checkbox"/> Mislabeled</td> <td><input type="checkbox"/> Fit/Function</td> <td><input type="checkbox"/> Off-set/Set-up</td> <td></td> </tr> </table> |  |                                                        |  | <input type="checkbox"/> Pressure/Forced | <input type="checkbox"/> Contamination | <input type="checkbox"/> Power Loss/Surge | <input type="checkbox"/> Positioned Wrong | <input type="checkbox"/> Bending | <input type="checkbox"/> Misaligned/off center | <input type="checkbox"/> Folio/Program | <input type="checkbox"/> Outside Tolerance | <input type="checkbox"/> Crushing | <input type="checkbox"/> BOM/Route | <input type="checkbox"/> Grain Direction | <input type="checkbox"/> Drawing | <input type="checkbox"/> Cracks | <input type="checkbox"/> Broken/Damage/Defect | <input type="checkbox"/> Weld | <input type="checkbox"/> Finish | <input type="checkbox"/> Crimp/Kink/Ripple/Wave/Twist | <input type="checkbox"/> Incomplete/Unclear Instructions | <input type="checkbox"/> Wrong Stock Pulled | <input type="checkbox"/> Part Lost/Missing | <input checked="" type="checkbox"/> Marks/Chatter | <input type="checkbox"/> Drill Holes | <input type="checkbox"/> Out of Sequence | <input type="checkbox"/> Misread | <input checked="" type="checkbox"/> Mislabeled | <input type="checkbox"/> Fit/Function | <input type="checkbox"/> Off-set/Set-up |  |
| <input type="checkbox"/> Pressure/Forced                                                                                                                                                                                                                                                                                                                                                       | <input type="checkbox"/> Contamination                   | <input type="checkbox"/> Power Loss/Surge                                                                                                | <input type="checkbox"/> Positioned Wrong  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |                                                        |  |                                          |                                        |                                           |                                           |                                  |                                                |                                        |                                            |                                   |                                    |                                          |                                  |                                 |                                               |                               |                                 |                                                       |                                                          |                                             |                                            |                                                   |                                      |                                          |                                  |                                                |                                       |                                         |  |
| <input type="checkbox"/> Bending                                                                                                                                                                                                                                                                                                                                                               | <input type="checkbox"/> Misaligned/off center           | <input type="checkbox"/> Folio/Program                                                                                                   | <input type="checkbox"/> Outside Tolerance |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |                                                        |  |                                          |                                        |                                           |                                           |                                  |                                                |                                        |                                            |                                   |                                    |                                          |                                  |                                 |                                               |                               |                                 |                                                       |                                                          |                                             |                                            |                                                   |                                      |                                          |                                  |                                                |                                       |                                         |  |
| <input type="checkbox"/> Crushing                                                                                                                                                                                                                                                                                                                                                              | <input type="checkbox"/> BOM/Route                       | <input type="checkbox"/> Grain Direction                                                                                                 | <input type="checkbox"/> Drawing           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |                                                        |  |                                          |                                        |                                           |                                           |                                  |                                                |                                        |                                            |                                   |                                    |                                          |                                  |                                 |                                               |                               |                                 |                                                       |                                                          |                                             |                                            |                                                   |                                      |                                          |                                  |                                                |                                       |                                         |  |
| <input type="checkbox"/> Cracks                                                                                                                                                                                                                                                                                                                                                                | <input type="checkbox"/> Broken/Damage/Defect            | <input type="checkbox"/> Weld                                                                                                            | <input type="checkbox"/> Finish            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |                                                        |  |                                          |                                        |                                           |                                           |                                  |                                                |                                        |                                            |                                   |                                    |                                          |                                  |                                 |                                               |                               |                                 |                                                       |                                                          |                                             |                                            |                                                   |                                      |                                          |                                  |                                                |                                       |                                         |  |
| <input type="checkbox"/> Crimp/Kink/Ripple/Wave/Twist                                                                                                                                                                                                                                                                                                                                          | <input type="checkbox"/> Incomplete/Unclear Instructions | <input type="checkbox"/> Wrong Stock Pulled                                                                                              | <input type="checkbox"/> Part Lost/Missing |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |                                                        |  |                                          |                                        |                                           |                                           |                                  |                                                |                                        |                                            |                                   |                                    |                                          |                                  |                                 |                                               |                               |                                 |                                                       |                                                          |                                             |                                            |                                                   |                                      |                                          |                                  |                                                |                                       |                                         |  |
| <input checked="" type="checkbox"/> Marks/Chatter                                                                                                                                                                                                                                                                                                                                              | <input type="checkbox"/> Drill Holes                     | <input type="checkbox"/> Out of Sequence                                                                                                 | <input type="checkbox"/> Misread           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |                                                        |  |                                          |                                        |                                           |                                           |                                  |                                                |                                        |                                            |                                   |                                    |                                          |                                  |                                 |                                               |                               |                                 |                                                       |                                                          |                                             |                                            |                                                   |                                      |                                          |                                  |                                                |                                       |                                         |  |
| <input checked="" type="checkbox"/> Mislabeled                                                                                                                                                                                                                                                                                                                                                 | <input type="checkbox"/> Fit/Function                    | <input type="checkbox"/> Off-set/Set-up                                                                                                  |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |                                                        |  |                                          |                                        |                                           |                                           |                                  |                                                |                                        |                                            |                                   |                                    |                                          |                                  |                                 |                                               |                               |                                 |                                                       |                                                          |                                             |                                            |                                                   |                                      |                                          |                                  |                                                |                                       |                                         |  |
| Other/Details:                                                                                                                                                                                                                                                                                                                                                                                 |                                                          |                                                                                                                                          |                                            | QC / QA Coordinator<br>DAS <u>68</u><br>9-89<br>SEP 05 2019                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                                                        |  |                                          |                                        |                                           |                                           |                                  |                                                |                                        |                                            |                                   |                                    |                                          |                                  |                                 |                                               |                               |                                 |                                                       |                                                          |                                             |                                            |                                                   |                                      |                                          |                                  |                                                |                                       |                                         |  |